

REMARKS

Claims 1-29 are pending. Claims 1, 4, 6, 8, 15, 19-20, 22, and 26-27, have been amended. Claims 7, 14, and 21 have been canceled without prejudice. No claims have been added. Accordingly, claims 1-6, 8-13, 15-20, and 22-29 remain pending.

In view of the following remarks/arguments, withdrawal of all outstanding objections and rejections to the pending claims is respectfully requested.

35 USC §112, Second Paragraph, Rejections

Claims 1, 4, 7, 8, 14-15, 21-22, and 26 stand rejected under 35 USC §112, second paragraph as failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In addressing claims 1, 4, 8, 15, 22, and 26, the Action asserts that these claims are improper because they use the term "comprising" instead of "consisting of." In view of this rejection, claims 1, 8, 15, and 22 have been amended so that they are not in Markush-type claim format. Claims 4, 6, 19-20, and 26-27, which depend from respective ones of amended claims 1, 8, 15, and 22, have also been amended to correspond to the amendments to their respective parent claims.

Accordingly, withdrawal of the 35 USC §112, second paragraph, rejection to claims 1, 4, 8, 15, 22, and 26, is respectfully requested.

With respect to claims 7, 14, and 21, the Action asserts that these claims are phrased in a way as to present what should be independent claims as dependent claims. For the reasons already articulated in the

1 Response filed January 3, 2005, Applicant respectfully disagrees.
2 However, to facilitate allowance of this case, Applicant has canceled claims
3 7, 14, and 21 without prejudice.

4
5 **35 USC §103(a) Rejections**

6 Claims 1-29 stand rejected under 35 USC §103(a) as being
7 unpatentable over U.S. Patent No. 6,308,279 to Toll et al ("Toll") in view
8 of US patent application number 6,584,571 to Fung. These rejections are
9 traversed.

10 Claim 1 recites in part "scheduling one or more threads according to
11 a predetermined periodic rate", "determining whether or not there are any
12 threads to execute", and "responsive to a determination that there are no
13 threads to execute, deactivating one or more of the hardware elements and
14 the program modules for a dynamic variable amount of time, the dynamic
15 variable amount of time being independent of the predetermined periodic
16 rate and being based on a sleep state of a set of threads in a sleep queue."

17 In addressing claim 1, the Action asserts that "scheduling one or
18 more threads according to a predetermined periodic rate", as claim 1
19 recites, is taught by Toll at col. 3, lines 38-45, and column 4, lines 58-63.

20 Applicant respectfully disagrees.

21 Toll at col. 3, lines 38-45, recites:

22 *"The MT processor 200 contains a first logical processor, or*
23 *"thread," 210 with an associated processor identifier*
24 *signal 1. The MT processor 200 also contains a second*
25 *logical processor 220 with an associated processor identifier*
signal 2. Although the MT processor 200 shown in FIG. 2
has two logical processors 210, 220, an alternative

1 *embodiment of the present invention may be used with*
2 *processors having any number of threads."*

3
4 Additionally, Toll at column 4, lines 58-63, recites:

5 *"Although various embodiments are specifically illustrated*
6 *and described herein, it will be appreciated that*
7 *modifications and variations of this embodiment of the*
8 *present invention are covered by the above teachings and*
9 *within the purview of the appended claims without departing*
10 *from the spirit and intended scope of the invention.."*

11 Referring to the above quoted sections of column 3, lines 38-45, and
12 column 4, lines 58-63, it is clear that Toll teaches that an MT processor, in
13 an alternative embodiment, may be used with any number of threads. It is
14 also clear that these explicit teachings are completely silent (i.e., do not
15 teach or suggest) scheduling anything according to a "predetermined
16 periodic rate", as claim 1 recites. Thus, it is respectfully submitted that the
17 cited portions of Toll to not teach or suggest what is been asserted by the
18 Action. Because Toll does not teach or suggest doing anything at a
19 "predetermined periodic rate", a system of Toll may never "scheduling one
20 or more threads according to a predetermined periodic rate", as claim 1
21 recites.

22 The Action does not rely on Fung to teach or suggest "scheduling
23 one or more threads according to a predetermined periodic rate", as claim 1
24 recites. However, nowhere does Fung teach or suggest these claim
25 features. It is respectfully submitted that with respect to threads, Fung
merely teaches that a routine "contains two threads of code", which include
a "COUNTER thread" and a "DOZE thread" (see Fung, col. 37, TABLE 1).
Nowhere does Fung teach scheduling any thread according to any time rate.

1 Thus, a system of Fung may never "scheduling one or more threads
2 according to a predetermined periodic rate", as claim 1 recites.
3 Accordingly, modifying Toll in view of Fung does not teach or suggest
4 "scheduling one or more threads according to a predetermined periodic
5 rate", as claim 1 recites.

6 For these reasons alone, the Action has not presented a prima facie
7 case of obviousness of claim 1 as being unpatentable over Toll in view of
8 Fung.

9 Additionally, the Action asserts that "responsive to a determination
10 that there are no threads to execute, deactivating one or more of the
11 hardware elements and the program modules for a dynamic variable
12 amount of time, the dynamic variable amount of time being independent of
13 the predetermined periodic rate", claim 1 recites, is taught by Toll at
14 column 2, lines 32-34, column 3, lines 8-12, and column 3, lines 16-18.
15 Applicant respectfully disagrees.

16 Toll at col. 2, lines 32-34, recites:

17 *"When every logical processor in a MT processor enter*
18 *thread sleep state, the clocks on the MT processor may be*
19 *turned off."*

20 Additionally, Toll at column 3, lines 8-12, recites:

21 *"Eventually, as a thread goes to sleep the micro-code*
22 *associated with that thread stops running. When the threads*
23 *in the MT processor are asleep, the hardware turns some of*
24 *the internal clocks off to reduce the amount of power being*
25 *used."*

24 Moreover, Toll at column 3, lines 16-18, recites:

1 *"When the processor senses a break event, it turns the*
2 *internal clocks back on and returns to the active power 110*
3 *mode."*

4 Referring to the above quoted sections of column 2, lines 32-34,
5 column 3, lines 8-12, and column 3, lines 16-18, it is clear that Toll teaches
6 that an MT processor may turn off clocks on in the processor responsive to
7 threads entering a sleep state, and that internal clocks are turned back on
8 responsive to a break event. However, these explicit teachings do not teach
9 or suggest doing anything for "a dynamic variable amount of time", as
10 claim 1 recites. For this reason alone, a system of Toll may never
11 "deactivating one or more of the hardware elements and the program
12 modules for a dynamic variable amount of time, the dynamic variable
13 amount of time being independent of the predetermined periodic rate", as
14 claim 1 recites.

15 The Action also asserts that "responsive to a determination that there
16 are no threads to execute, deactivating one or more of the hardware
17 elements and the program modules for a dynamic variable amount of time,
18 the dynamic variable amount of time being independent of the
19 predetermined periodic rate", claim 1 recites, is taught by Fung at
20 column 6, lines 14-30, and lines 45-51. Applicant respectfully disagrees.

21 Fung at col. 6, lines 14-30, recites:

22 *"After having entered one or more of the activity states of the*
23 *conservation mode, the power management unit switches*
24 *back to the active mode when activity is sensed by the*
25 *monitors.*

Power Management Unit-- FIG. 2

1 In FIG. 2, a block diagram of the power management unit 15
2 of FIG. 1 is shown. The power management unit includes a
3 hardware monitor 79 (including an activity monitor 16 and a
4 timer unit 24), a software monitor 80 , a state control unit
5 23, a power control unit 17 , a clock control unit 18 , and a
6 refresh control unit 20 . The hardware monitor 79 (using
7 activity monitor 16) analyzes the address activity on the
8 system bus 5 to provide activity information used to control
9 power management. The timer unit 24 times the activity
10 information sensed by the monitor 16 . The state control unit
11 23 controls the changes among different power consumption
12 states to achieve power management.

13 The power control unit 17 controls the switches 22 - 0 ,
14 22 -n of FIG. 1 as a function of the activity sensed by activity
15 monitor 16 and the state determined by state control unit 23."

16 Additionally, Fung at column 6, lines 45-51, recites:

17 "This management is accomplished using an activity monitor
18 16 to detect periods of system inactivity. During periods of
19 inactivity, power consumption is reduced by reducing clock
20 speeds or removing clocks through clock control unit 18,
21 and/or by removing power through power control unit 17,
22 and/or by controlling the refresh frequency through refresh
23 control unit 20."

24 Referring to the above quoted sections of Fung at column 6, lines
25 14-30, lines 45-51, it is clear that Fung teaches that a power management
unit switches to an active mode upon sensing hardware or software
activity, and that during periods of inactivity, power consumption is
reduced. However, nowhere do these explicit descriptions teach or suggest
doing anything for "a dynamic variable amount of time", as claim 1 recites.
For this reason alone, a system of Fung may never "deactivating one or
more of the hardware elements and the program modules for a dynamic

1 variable amount of time, the dynamic variable amount of time being
2 independent of the predetermined periodic rate", as claim 1 recites.

3 In view of the above, the combination of Toll in view of Fung does
4 not teach or suggest "deactivating one or more of the hardware elements
5 and the program modules for a dynamic variable amount of time, the
6 dynamic variable amount of time being independent of the predetermined
7 periodic rate", as claim 1 recites.

8 For these additional reasons, the Action has not presented a prima
9 facie case of obviousness of claim 1 as being unpatentable over Toll in
10 view of Fung.

11 Accordingly, and for each of the above reasons, the 35 USC §103(a)
12 rejection of claim 1 as being unpatentable over Toll in view of Fung is
13 improper and should be withdrawn.

14 Claims 2 - 7 depend from claim 1 and are allowable over the cited
15 combination solely by virtue of this dependency. Accordingly, and for this
16 reason alone, the 35 USC §103(a) rejections of claims 2-7 over Toll is
17 improper and should be withdrawn.

18 Additionally, claims 2-7 include additional subject matter that is not
19 taught or suggested by the cited combination.

20 For example, claim 6 recites in part "setting a system timer to
21 generate a notification at the predetermined periodic rate". For the reasons
22 already discussed above with respect to claim 1, Toll in view of Fung does
23 not teach or suggest, "scheduling one or more threads according to a
24 predetermined periodic rate", as claim 1 recites. For the reasons already
25 discussed above with respect to claim 1, Toll in view of Fung does not

1 teach or suggest, "scheduling one or more threads according to a
2 predetermined periodic rate", as claim 1 recites. For this reason alone, the
3 cited combination cannot teach these additional recited features of claim 6,
4 which depend on the previously claimed "predetermined periodic rate".

5 For these additional reasons, the Action has not presented a prima
6 facie case of obviousness with respect to claim 6, and withdrawal of the 35
7 USC §103(a) rejection of claim 6 is respectfully requested.

8 In another example, claim 6 recites in part "resetting the system
9 timer to generate the notification after the dynamic variable amount of time
10 has elapsed since the deactivating", "receiving the notification after the
11 dynamic variable amount of time has elapsed since the deactivating",
12 "responsive to the receiving: resetting the system timer to generate the
13 notification at the predetermined periodic rate" and "activating the one or
14 more of the hardware elements and the program modules." For the reasons
15 already discussed above with respect to claim 1, Toll in view of Fung does
16 not teach or suggest, doing anything with respect to a "dynamic variable
17 amount of time". For this reason alone, the cited combination cannot teach
18 these additional recited features of claim 6, which do something "after the
19 dynamic variable amount of time has elapsed".

20 For these additional reasons, the Action has not presented a prima
21 facie case of obviousness with respect to claim 6, and withdrawal of the 35
22 USC §103(a) rejection of claim 6 is respectfully requested.

23 **Claim 8** recites "scheduling one or more threads at a predetermined
24 periodic rate", "determining whether or not there are any threads to
25 execute", "responsive to a determination that there are no threads to

1 execute, deactivating one or more of the hardware elements and the
2 program modules for a dynamic variable amount of time, the dynamic
3 variable amount of time being based on a sleep state of a set of threads in a
4 sleep queue and independent of the predetermined periodic rate", and
5 "activating the one or more of the hardware elements and the program
6 modules only when the operating system needs to perform an action
7 selected from a group of actions comprising scheduling a thread for
8 execution upon expiration of the dynamic variable amount of time since the
9 deactivating, or upon receipt of an external event that is not a system timer
10 event". For the reasons clearly articulated above with respect to claim 1,
11 Toll in view of Fung does not teach or suggest these recited features of
12 claim 8.

13 Accordingly, withdrawal of the 35 USC §103(a) rejection of claim 8
14 is respectfully requested.

15 Claims 9-14 depend from claim 8 and are allowable over the cited
16 combination solely by virtue of this dependency.

17 Accordingly, withdrawal of the 35 USC §103(a) rejection of
18 claims 9-14 is respectfully requested.

19 Moreover, claim 12 includes additional features that are not obvious
20 over Toll in view of Fung. Specifically, claim 12 recites "wherein the
21 scheduling further comprises setting a system timer to the predetermined
22 periodic rate, the predetermined periodic rate corresponding to a thread
23 scheduling accuracy", and "wherein the deactivating further comprises
24 resetting the system timer to generate a notification after the dynamic
25 variable amount of time has elapsed since the deactivating." For the

1 reasons already discussed above with respect to claim 1, Toll in view of
2 Fung does not teach or suggest, "scheduling one or more threads at a
3 predetermined periodic rate", as claim 8 recites (claim 12 depends on
4 claim 8). For this reason alone, the cited combination cannot teach the
5 additional features of claim 12, which depend on the previously claimed
6 "predetermined periodic rate".

7 For these additional reasons, the Action has not presented a prima
8 facie case of obviousness with respect to claim 12, and the 35 USC §103(a)
9 rejection of claim 12 should be withdrawn.

10 In another example, claim 13 recites "wherein the deactivating
11 further comprises resetting a system timer to generate a notification after
12 the dynamic variable amount of time has elapsed, the dynamic variable
13 amount of time being a maximum amount of time that a thread can yield to
14 other threads before needing to be scheduled for execution", and "wherein
15 the activating further comprises resetting the system timer to the
16 predetermined periodic rate to provide substantial thread scheduling
17 accuracy." For the reasons already discussed above, the cited combination
18 is completely silent on doing anything with "the dynamic variable amount
19 of time".

20 Accordingly, and for this additional reason, the 35 USC §103(a)
21 rejection of claim 13 over the cited combination is improper and should be
22 withdrawn.

23 Claim 15 recites "determining at a periodic rate whether or not there
24 are any threads to execute", and "responsive to a determination that there
25 are no threads to execute, deactivating one or more of the program modules

1 and the hardware elements for a dynamic variable amount of time, the
2 dynamic variable amount of time being independent of the periodic rate, the
3 dynamic variable amount of time being based on a sleep state of a set of
4 threads in a sleep queue.” For the reasons clearly articulated above with
5 respect to claim 1, Toll in view of Fung does not teach or suggest these
6 recited features.

7 Accordingly, the 35 USC §103(a) rejection of claim 15 over the
8 cited combination is improper and should be withdrawn.

9 Claims 16-21 depend from claim 15 and are allowable over Toll
10 solely by virtue of this dependency. Accordingly, withdrawal of the 35
11 USC §103(a) rejection of claims 16-21 is respectively requested.

12 Moreover, claim 19 includes additional features that are not taught
13 or suggested by Toll in view of Fung. Specifically, claim 19 recites “in the
14 deactivating, configuring a system timer to send a first timer interrupt after
15 the dynamic variable amount of time has elapsed, the dynamic variable
16 amount of time being a maximum amount of time that a first thread can
17 yield to a second thread before the first thread needs to be executed”, and
18 “responsive to receiving the first timer interrupt: (a) configuring the system
19 timer to send a second timer interrupt at the periodic rate” and “(b)
20 activating the one or more of the program modules and at the hardware
21 elements to determine if there are any threads to execute.” At least for the
22 reasons already discussed above, Toll in view of Fung does not teach or
23 suggest “the dynamic variable amount of time”, as Applicant claims.
24 Accordingly, and for this additional reason, the 35 USC §103(a) rejection
25 of claim 19 is improper and should be withdrawn.

1 **Claim 22** recites in part "scheduling threads for execution at a
2 periodic time interval", "determining that there are no threads to execute",
3 and "wherein the HAL, responsive to the determining, comprises computer-
4 executable instructions for deactivating, for a dynamic variable amount of
5 time, one or more of the scheduler, the hardware elements, the one or more
6 operating system program modules, and the application program modules,
7 the dynamic variable amount of time being independent of the periodic
8 time interval and being based on a sleep state of a set of threads in a sleep
9 queue." For the reasons are discussed above with respect claim 1, Toll in
10 view of Fung do not teach or suggest these recited features.

11 Accordingly, the 35 USC §103(a) rejection of claim 22 over the
12 cited combination should be withdrawn.

13 **Claims 23-29** depend from claim 22 and are allowable over the cited
14 combination solely by virtue of this dependency. Accordingly, the 35 USC
15 §103(a) rejections of claims 23-29 should be withdrawn.

16 Moreover, claim 29 includes additional features that are not taught
17 or suggested by Toll in view of Fung. Specifically, claim 29 recites
18 "receiving a notification in response to an external event, the external event
19 not being a system timer event, responsive to receipt of the notification, the
20 HAL processing the notification in a manner that the scheduler remains
21 deactivated for the dynamic variable amount of time." For the reasons
22 already discussed above with respect to claim 6, Toll in view of Fung does
23 not teach or suggest "a dynamic variable amount of time", as claim 22
24 recites, and upon which claim 29 depends. Because of this, the cited
25

1 combination cannot teach these additional features that depend on "the
2 dynamic variable amount of time".

3 Accordingly, withdrawal of the 35 USC §103(a) rejection of claim
4 29 is respectfully requested.

5
6 Conclusion

7 Pending claims 1-6, 8-13, 15-20, and 22-29 are in condition for
8 allowance, and action to that end is respectfully requested. Should any
9 issue remain that prevents allowance of the application, the Office is
10 encouraged to contact the undersigned prior or issuance of a subsequent
11 action.

12
13 Respectfully submitted,

14
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